APPENDIX

CLAIMS (with indication of status) :

Claim 1. (Previously presented) A method for transforming a digitized image, said method comprising: providing said image as a plurality of pixels, wherein data for each pixel is in a first format which is a grey scale image; and

processing said data of each of said pixels by employing data from a region of interest which includes at least one pixel following said each of said pixels, and includes a plurality of neighboring pixels,

and producing a second format which is a binary image, and

said method further comprising determining a dynamic range of pixel values of pixels in an encompassing neighborhood of the region of interest, and

wherein the step of processing includes making dynamic adjustments depending on the dynamic range of pixel values, wherein the step of making said dynamic adjustments includes producing a visually pleasing transition between text and picture areas in said image;

and wherein said producing a visually pleasing transition includes:

if said dynamic range is high, implying said pixels in said encompassing neighborhood of said region of interest are in a text area or a line art area or in an area of an image that has a high contrast edge, wherein the edges of said text area, line art area and area of an image having high contrast edge are sharpened by computing a pixel data threshold value for said region of interest;

and comparing each pixel value in said region of interest to said pixel data threshold;

if said pixel value is greater than the pixel data threshold value,
a first value is placed in the corresponding position of the said second format image;

if said pixel value is less than or equal to the pixel data threshold value,
a second value is placed in the corresponding position of the said second format image;

if said dynamic range is medium,

computing a desired number of second values to be placed in said second format image in the region of interest;

ordering the pixels in the region of interest according to the ordering of a predetermined halftone array;

altering the order of a pixel in said ordering if said pixel has a value which is greater than the value of the next pixel in said order by a predetermined reordering threshold value;

repeating said altering of the pixel order until the first and second values chosen for the second format image are no longer changed;

choosing said desired number of second values for the second format from the beginning of the said order, and assigning the remaining pixels values in the region of interest to said first value;

if said dynamic range is low,
using said predetermined halftone array to compute said first and second values for said second format image.

Claims 2 - 9 canceled.

Claim 10. (Previously presented) The method as in claim 1 where a number of second value is determined, said number to be placed in said second format grey scale image based on a weighted function of the image intensity values within the region of interest of said first format image.

Claim 11. (Previously presented) The method as in claim 10 wherein said plurality of regions-of-interest form the entire said first grey scale format.

Claim 12. (Previously presented) An article of manufacture comprising a computer usable medium having computer readable program code means embodied therein for causing a digital image to be transformed, the computer readable program code means in said article of manufacture comprising computer readable program code means for causing a computer to effect the steps of :

providing said image as a plurality of pixels, wherein data for each pixel is in a first format which is a grey scale image; and

processing said data of each of said pixels by employing data from a region of interest which includes at least one pixel following said each of said pixels, and includes a plurality of neighboring pixels,

and producing a second format which is a binary image, and

said method further comprising determining a dynamic range of pixel values of pixels in an encompassing neighborhood of the region of interest, and

wherein the step of processing includes making dynamic adjustments depending on the dynamic range of pixel values, wherein the step of making said dynamic adjustments includes producing a visually pleasing transition between text and picture areas in said image;

and wherein said producing a visually pleasing transition includes:

if said dynamic range is high, implying said pixels in said encompassing neighborhood of said region of interest are in a text area or a line art area or in an area of an image that has a high contrast edge, wherein the edges of said text area, line art area and area of an image having high contrast edge are sharpened by computing a pixel data threshold value for said region of interest;

and comparing each pixel value in said region of interest to said pixel data threshold;

if said pixel value is greater than the pixel data threshold value,
a first value is placed in the corresponding position of the said second format image;

if said pixel value is less than or equal to the pixel data threshold value,
a second value is placed in the corresponding position of the said second format image;

if said dynamic range is medium,

computing a desired number of second values to be placed in said second format image in the region of interest;

ordering the pixels in the region of interest according to the ordering of a predetermined halftone array;

altering the order of a pixel in said ordering if said pixel has a value which is greater than the value of the next pixel in said order by a predetermined reordering threshold value;

repeating said altering of the pixel order until the first and second values chosen for the second format image are no longer changed;

choosing said desired number of second values for the second format from the beginning of the said order, and assigning the remaining pixels values in the region of interest to said first value;

if said dynamic range is low,

using said predetermined halftone array to compute said first and second values for said second format image.

13. (Previously presented) A program storage device readable by machine, tangibly embodying the program of instructions executable by the machine to perform method steps for transforming a digitized image, said method steps comprising the steps of:
providing said image as a plurality of pixels, wherein data for each pixel is in a first format which is a grey scale image; and

processing said data of each of said pixels by employing data from a region of interest which includes at least one pixel following said each of said pixels, and includes a plurality of neighboring pixels,

and producing a second format which is a binary image, and

said method further comprising determining a dynamic range of pixel values of pixels in an encompassing neighborhood of the region of interest, and

wherein the step of processing includes making dynamic adjustments depending on the dynamic range of pixel values, wherein the step of making said dynamic adjustments includes producing a visually pleasing transition between text and picture areas in said image;

and wherein said producing a visually pleasing transition includes:

if said dynamic range is high, implying said pixels in said encompassing neighborhood of said region of interest are in a text area or a line art area or in an area of an image that has a high contrast edge, wherein the edges of said text area, line art area and area of an image having high contrast edge are sharpened by computing a pixel data threshold value for said region of interest;

and comparing each pixel value in said region of interest to said pixel data threshold;

if said pixel value is greater than the pixel data threshold value,
a first value is placed in the corresponding position of the said second format image;

if said pixel value is less than or equal to the pixel data threshold value,
a second value is placed in the corresponding position of the said second format image;

if said dynamic range is medium,

computing a desired number of second values to be placed in said second format image in the region of interest;

ordering the pixels in the region of interest according to the ordering of a predetermined halftone array;

altering the order of a pixel in said ordering if said pixel has a value which is greater than the value of the next pixel in said order by a predetermined reordering threshold value;

repeating said altering of the pixel order until the first and second values chosen for the second format image are no longer changed;

choosing said desired number of second values for the second format from the beginning of the said order, and assigning the remaining pixels values in the region of interest to said first value;
if said dynamic range is low,

using said predetermined halftone array to compute said first and second values for said second format image.

14. (Canceled) A method for processing at least a portion of an image, the method comprising employing a first rule of halftoning, a second rule of halftoning, a third rule of half toning and a fourth rule of halftoning.

15. (Canceled)

16. (Currently amended) An article of manufacture comprising a computer usable medium having computer readable program means embodied therein for causing processing at least a portion of an image, the computer readable program code means in said article of manufacture comprising computer readable code means for causing a computer to effect the steps: ~~defined in claim 14~~

providing said image as a plurality of pixels, wherein data for each pixel is in a first format which is a grey scale image; and

processing said data of each of said pixels by employing data from a region of interest which includes at least one pixel following said each of said pixels, and includes a plurality of neighboring pixels,

and producing a second format which is a binary image, and

said method further comprising determining a dynamic range of pixel values of pixels in an encompassing neighborhood of the region of interest, and

wherein the step of processing includes making dynamic adjustments depending on the dynamic range of pixel values, wherein the step of making said dynamic adjustments includes producing a visually pleasing transition between text and picture areas in said image;

and wherein said producing a visually pleasing transition includes:
if said dynamic range is high, implying said pixels in said encompassing neighborhood of said region of interest are in a text area or a line art area or in an area of an image that has a high contrast edge, wherein the edges of said text area, line art area and area of an image having high contrast edge are sharpened by computing a pixel data threshold value for said region of interest;

and comparing each pixel value in said region of interest to said pixel data threshold;

if said pixel value is greater than the pixel data threshold value,
a first value is placed in the corresponding position of the said second format image;

if said pixel value is less than or equal to the pixel data threshold value,
a second value is placed in the corresponding position of the said second format image;

if said dynamic range is medium,

computing a desired number of second values to be placed in said second format image in the region of interest;

ordering the pixels in the region of interest according to the ordering of a predetermined halftone array;

altering the order of a pixel in said ordering if said pixel has a value which is greater than the value of the next pixel in said order by a predetermined reordering threshold value;

repeating said altering of the pixel order until the first and second values chosen for the second format image are no longer changed;

choosing said desired number of second values for the second format from the beginning of the said order, and assigning the remaining pixels values in the region of interest to said first value; if said dynamic range is low,

using said predetermined halftone array to compute said first and second values for said second format image.

17. (Canceled)